

PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

To:

TRANSLATION
PCT

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43b/c.1)

Date of mailing (day/month/year)		See form PCT/ISA/210
Applicant's or agent's file reference 2004 DE 302		FOR FURTHER ACTION See paragraph 2 below
International application No. PCT/EP2005/000361	International filing date (day/month/year) 15.01.2005	Priority date (day/month/year) 26.01.2004
International Patent Classification (IPC) or both national classification and IPC* C07C253/20, C07C253/22, C07C291/10, C07C255/50		
Applicant CLARIANT PRODUKTE (DEUTSCHLAND) GMBH		

<p>1. This opinion contains indications relating to the following items:</p> <p><input checked="" type="checkbox"/> Box No. I Heads of the opinion</p> <p><input type="checkbox"/> Box No. II Priority</p> <p><input type="checkbox"/> Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability</p> <p><input type="checkbox"/> Box No. IV Lack of unity of invention</p> <p><input checked="" type="checkbox"/> Box No. V Reasoned statement under Rule 43b/c.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement</p> <p><input type="checkbox"/> Box No. VI Certain documents cited</p> <p><input type="checkbox"/> Box No. VII Certain defects in the international application</p> <p><input type="checkbox"/> Box No. VIII Certain observations on the international application</p>	
<p>2. FURTHER ACTION</p> <p>If a demand for international preliminary examination is made, this opinion will be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA") except that this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1(b)(ii) that written opinions of this International Searching Authority will not be so considered.</p> <p>If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.</p> <p>For further options, see Form PCT/ISA/220.</p>	
<p>3. For further details, see notes to Form PCT/ISA/220.</p>	
Name and mailing address of the ISA/BP	Authorized officer
Facsimile No.	Telephone No.

Form PCT/ISA/237 (cover sheet) (January 2004)

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

International application No.

PCT/EP2005/000361

Box No. 1

Body of this opinion

1. With regard to the language, this opinion has been established on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.

☐

This opinion has been established on the basis of a translation from the original language into the following language:

_____ which is the language of a translation furnished for the purposes of international search (under Rule 12.3 and 23.1(h)).

2. With regard to any nucleotide and/or amino acid sequence disclosed in the international application and necessary to the claimed invention, this opinion has been established on the basis of:

a. type of material

☐

a sequence listing

☐

table(s) related to the sequence listing

b. format of material

☐

in written format

☐

in computer readable form

c. time of filing/furnishing

☐

contained in the international application as filed.

☐

filed together with the international application in computer readable form.

☐

furnished subsequently to this Authority for the purposes of search.

3. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table(s) relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.

4. Additional comments:

Form PCT/ISA/237 (Box No. 1) (January 2004)

WRITTEN OPINION ON THE INTERNATIONAL SEARCHING AUTHORITY		International application No. PCT/EP2005/000361
Box No. V	Reasoned statement under Rule 43bis (a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement	
1. Statement		
Novelty (N)	Claims <u>1-9</u>	YES
	Claims _____	NO
Inventive step (IS)	Claims <u>1-9</u>	YES
	Claims _____	NO
Industrial applicability (IA)	Claims <u>1-9</u>	YES
	Claims _____	NO
2. Citations and explanations:		
Reference is made to the following documents:		
D1 J. MARCH: "Advanced Organic Chemistry, second edition" 1977, MCGRAW-HILL INTERNATIONAL BOOK COMPANY, AUCKLAND, pages 963-964		
D2 US-A-2 200 734		
D3 ANGEWANDTE CHEMIE, vol. 92, no. 2, 1980, pages 129-130		
Novelty		
The present invention relates to a process for preparing a) nitriles of the formula R-CN and b) isonitriles of the formula R-NC by reacting		
a) carboxamides, ammonium salts of carboxylic acids or carboxylic acids in the presence of ammonia or ammonium salts		
or		
b) formamides or mixtures of amines with formic acid with cyclic phosphonic anhydrides with elimination of water at a temperature in the range from -30 to +120°C.		
None of the present documents describes a process for preparing nitriles or isonitriles in the presence of cyclic phosphonic anhydrides. Claim 1 and dependent claims 2-9 therefore appear to meet the requirements of PCT Article 33(2).		
Inventive step		
The preparation of nitriles or isonitriles by dehydration of		

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WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

International application No.

PCT/EP2005/000361

Box No. V

Reasoned statement under Rule 43bis(1)(a)(ii) with regard to novelty, inventive step or industrial applicability;
clusions and explanations supporting each statement

carboxamides, ammonium salts of carboxylic acids or carboxylic acids in the presence of ammonia or ammonium salts or formamides or mixtures of amines with formic acid are known reactions, see documents D1 and D2 and pages 1 and 2 of the application. These reactions are carried out in the presence of a variety of dehydration reagents, e.g. P_2O_5 , $POCl_3$, etc., or with the aid of dicyclohexylcarbodiimide (DCC). Disadvantages of these processes are that undesirable secondary reactions such as epimerizations or reactions with other groups frequently occur or products of further reactions which are difficult or complicated to remove, e.g. in the case of reaction with DCC, occur.

The technical problem addressed by the application can therefore be considered that of providing an improved process for preparing nitriles or isonitriles by means of which the desired products can be obtained with high selectivity.

The problem was solved by the use of cyclic phosphonic anhydrides as dehydration reagents at a temperature of from -30 to $+120^\circ\text{C}$.

Cyclic phosphonic anhydrides are known as convenient-to-use and highly selective reagents for selective amide coupling, see, for example, D3 of page 1 of the description. However, it cannot be concluded from this material fact that cyclic phosphonic anhydrides would also be suitable as highly selective dehydration reagents for carboxamides, ammonium salts of carboxylic acids, carboxylic acids in the presence of ammonia or ammonium salts, formamides or mixtures of amines with formic acid in order to prepare nitriles or isonitriles. A person skilled in the art faced with this problem of preparing nitriles and isonitriles with high selectivity might not consider documents concerned with the condensation of amino acids for solving the problem. None of the available documents therefore suggests the use of cyclic phosphonic anhydrides in the preparation of nitriles or isonitriles to a person skilled in the art.

The subject matter of claims 1-9 therefore appears to involve an inventive step (PCT Article 33(3)).

Industrial applicability

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WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY		International application No. PCT/EP2005/000361
Box No. V	Reasoned statement under Rule 43bis(1)(ii) with regard to novelty, inventive step or industrial applicability; claims and explanations supporting such statement	
<p>There are no objections with regard to industrial applicability.</p> <p>• Further remarks:</p> <p>Documents which reflect the prior art described on page 1 (e.g. D1 and D3) have not been indicated in the description (PCT Rule 5.1(a)(ii)).</p> <p>Expressions prefaced with "preferred", "preferably", "in particular" or similar terms (see claims 3 and 6) do not restrict the subject matter of a claim. These claims therefore do not meet the requirement of clarity (PCT Article 6). However, it is possible to make preferred features the subject matter of dependent claims.</p>		